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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/975,840	10/11/2001	Min-Hsiung Chiang	67,200-547	2281

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EXAMINER	
KESHAVAN, BELUR V	
ART UNIT	PAPER NUMBER
2825	

DATE MAILED: 09/25/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Applicati n N .	Applicant(s)	
	09/975,840	CHIANG, MIN-HSIUNG	
	Examiner	Art Unit	
	Belur V Keshavan	2825	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *07/07/2003* .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☐ Claim(s) _____ is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-28* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *11 October 2001* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Drawings

The drawings are objected to under 37 CFR 1.83(a) because they fail to show features as described in the specification. Any structural detail that is essential for a proper understanding of the disclosed invention should be shown in the drawing. MPEP § 608.02(d). A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Applicant is requested to revise **drawings** without adding any new material. Any structural detail that is essential for a proper understanding of the disclosed invention should be shown in the drawing. The following are some of the items that require revision.

In figures 1-15, gate oxide over which DRAM poly gate is formed and semiconductor substrate in which STI is formed are not shown.

In figures 2-15, LDD is not indicated.

In figure 3, an IPO-1 and plug ion implant are not shown.

In figure 6, SiON layer is not indicated. It is not clear from figures 1-5 when SiON was formed.

In figure 8, outline of resist is not shown. Location of the resist is not clear.

In figure 9, it is not clear as to what material is left after dry etching of TEOS. Also in figure 9 the outline of resist is not shown.

In figure 10, space TEOS is not shown.

In figures 10-15, it is not clear what is the material on 34, 36 and 38.

In figure 12, it is not clear whether S/D implant is done only in DRAM area.

In figure 13, it is not clear where Cobalt silicide is formed with respect to doped polysilicon. Also location of silicon nitride spacer 92 is not clear.

In figure 14, it is not clear where SION is formed. Cobalt silicide and SION are shown as the same feature the figure. It is not clear what is flow operation.

In figure 15, tungsten plug is not shown. Metal two layer, the dielectric of the MIM capacitor and MIM capacitor are not shown.

In figure 17, it is not clear what RPO means.

Specification

35 U.S.C. 112, first paragraph, requires the specification to be written in "full, clear, concise, and exact terms." The specification is replete with terms, which are not clear, concise and exact. The specification should be revised carefully in order to comply with 35 U.S.C. 112, first paragraph. Some of the examples of the above non-compliance of the specification under 35 U.S.C. 112, first paragraph, are already given in the office action of April 1, 2003. The specification should be revised carefully in order to comply with 35 U.S.C. 112, first paragraph, without introduction of new matter.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claim1-28 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter, which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

As claimed in claims 1 and 14, the method of fabricating MIM capacitor and self aligned contact is not described in the specification in such a way as to enable a person of ordinary skill in the art to make and/or use the invention. As claimed in claim 1, combining of salicide gate and self aligned contact in a memory cell area is not describe in the specification as to enable a person of ordinary skill in the art to make and/or use the invention. As claimed in claim 14, fabricating MIM capacitor is not described in the specification in such a way as to enable a person of ordinary skill in the art to make and/or use the invention. Formation of the dielectric of the MIM capacitor and formation the metal-two is not described in the specification in such a way as to enable a person of ordinary skill in the art to make and/or use the invention.

As claimed in claims 15 and 28 the system for fabricating a MIM capacitor is not described in the specification in such a way as to enable a person of ordinary skill in the art to make and/or use the invention. Claims 15 –28 lack method system for fabricating a MIM capacitor.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1, 2 and 10-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Huang et al. (U.S. Patent No. 6,146,941) in view of S. Wolf (Silicon Processing for the VLSI Era, Volume 2, Pages 144-152).

Regarding claims 1 and 2 Huang et al. discloses, in columns 4-6 and in figures 2A-2F, a method of fabricating a capacitor formed on a substrate wherein the capacitor is used in a semiconductor device comprising the following steps: designating and patterning a gate comprising polysilicon (206) for the semiconductor device; patterning configuring a self aligned contact and performing an implant, in column 5 and lines 1-28, for the semiconductor device and; combining the gate and SAC in a memory cell area of the semiconductor device, in column 4 and lines 65-66. However, Huang et al. lack a salicide gate. Wolf teaches in figure 3-39 on page 145 salicide gate processing steps along with SAC. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to combine the teachings of Huang et al. with that of Wolf to fabricate a capacitor in a semiconductor device with a low contact resistance and to increase memory cell density.

Claims 10-13, dependent on claim 1, are rejected as claims 10-13 do not have additional method steps in the claims.

Allowable Subject Matter

Claim3-9 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement or reasons for the indication of allowable subject matter:

The primary reason for the indication of the allowability of claims 3-9 is the inclusion therein, in combination as currently claimed, of the limitation of depositing TEOS, silicon nitride, and BPTEOS upon a layer formed on a substrate and performing an IPTO planarization upon a layer formed on the substrate. These limitations found in claims 3-9 are not disclosed nor taught by the prior art of record alone or in combination.

Response to Arguments

Applicants' arguments filed on 07/07/2003 have been fully considered but they are not persuasive.

The examiner has noted the change to title of the invention, amendments to specification and to claims. The applicants have amended specification where the term "gate oxide" is no longer there to refer to figure 1. However, any structural detail, like the gate oxide in DRAM, that is essential for a proper understanding of the disclosed invention should be shown in the drawing. MPEP § 608.02(d). The examiner agrees that the term deposited as well as implant is very well known in the art. However LDD is formed by ion implantation but not by deposition. The examiner notes that an unexplained acronym RPO has been removed from the specification yet the unexplained acronym RPO is still in figure 17. Regarding claims 1-28, the examiner notes applicants' arguments that inventive steps of forming a MIM capacitor and a self aligned contact is described in totality in the application. However the drawings and the specification lack the inventive steps of forming the insulator and the second electrode. Regarding the rejection under 35 U.S.C. 103, the examiner notes the arguments regarding the motivation for the

combination of the teachings of Huang with that of Wolf. The motivation for the combination of the teachings was given in the Office Action of April 1, 2003. Again, the motivation for the combination of the teachings is to fabricate a MIM capacitor in a semiconductor device with low contact resistance and to increase memory cell density.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Belur V Keshavan whose telephone number is 703 306 5985. The examiner can normally be reached on 8-4:30 Monday to Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Smith can be reached on 703 308 1323. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703 308 0956.

Bvk.
September 17, 2003.

Belur V. Keshavan.
Examiner. Art Unit 2825.

MATTHEW SMITH
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800